

AMENDMENTS TO THE CLAIMS

1. (withdrawn): A method for manufacturing a light emitting diode having a transparent substrate, the method comprising:
5 forming a semiconductor multilayer on a first substrate producing a first multilayer structure;
forming an amorphous interface layer on a second substrate, the second substrate being transparent in nature, producing a second multilayer structure;
bonding the first multilayer structure to the second multilayer structure,
10 producing a third multilayer structure; and
removing the first substrate from the third multilayer structure.
2. (withdrawn): The method of claim 1 further comprising a step of forming a transparent conductive layer on the third multilayer structure after removing
15 the first substrate.
3. (withdrawn): The method of claim 1, wherein the amorphous interface layer is made of at least one selected from a group comprising indium tin oxide, indium cadmium oxide, indium tin oxide, and transparent conductive
20 adhesive agent.
4. (withdrawn): A method for manufacturing a light emitting diode, comprising:
forming a semiconductor multilayer on a first substrate producing a first
25 multilayer structure;
forming an amorphous interface layer on a second substrate, the second substrate being transparent in nature, producing a second multilayer structure;
bonding the first multilayer structure to the second multilayer structure,
producing a third multilayer structure; and
30 removing the first substrate from the third multilayer structure.
5. (withdrawn): The method of claim 4 further comprising a step of forming a

transparent conductive layer on the third multilayer structure after removing the first substrate.

- 5 6. (withdrawn): The method of claim 4, wherein the amorphous interface layer is made of at least one selected from a group comprising indium tin oxide, cadmium tin oxide, antimony tin oxide, and transparent conductive adhesive agent.
- 10 7. (original): A light emitting diode having a transparent substrate, the light emitting diode comprising:
a transparent substrate;
an amorphous interface layer formed on the transparent substrate;
a top surface of the amorphous interface layer comprising a first surface region and a second surface region;
15 a p⁺-type contact layer formed on the first surface region;
a p-type cladding layer formed on the p⁺-type contact layer;
a multiple quantum well (MQW) light-emitting layer formed on the p-type cladding layer;
an n-type cladding layer formed on the MQW light-emitting layer;
20 an n-type stop layer formed on the n-type cladding layer;
a transparent conductive layer formed on the n-type stop layer;
a first electrode formed on the transparent conductive layer; and
a second electrode formed on the second surface region.
- 25 8. (original): A light emitting diode having a transparent substrate, the light emitting diode comprising:
a transparent substrate comprising sapphire;
an amorphous interface layer formed on the transparent substrate, a top surface of the amorphous interface layer comprising a first surface region and a
30 second surface region;
a contact layer of p⁺-type GaAs formed on the first surface region;
a p-type cladding layer of p-type AlGaInP formed on the contact layer.

- a light-emitting layer of AlGaInP formed on the p-type cladding layer;
- an n-type cladding layer of n-type AlGaInP formed on the light-emitting layer;
- a stop layer of n-type AlGaAs formed on the n-type cladding layer;
- an ITO transparent conductive layer formed on the stop layer.
- 5 a first electrode formed on the ITO transparent conductive layer.
- a second electrode formed on the second surface region.

9. (original): A light emitting diode having a transparent substrate, the light emitting diode comprising:
- 10 an ohmic contact electrode;
 - a p-type transparent substrate formed on the ohmic contact electrode;
 - a first p⁺-type contact layer formed on the transparent substrate;
 - an amorphous interface layer formed on the first p⁺-type contact layer;
 - a second p⁺-type contact layer formed on the amorphous interface layer;
 - 15 a p-type cladding layer formed on the second p⁺-type contact layer;
 - a light-emitting layer formed on the p-type cladding layer;
 - an n-type cladding layer formed on the light-emitting layer;
 - an n-type stop layer formed on the n-type cladding layer;
 - a transparent conductive layer formed on the n-type stop layer; and
 - 20 a first electrode formed on the transparent conductive layer.

10. (original): A light emitting diode having a transparent substrate, the light emitting diode comprising:
- an ohmic contact electrode;
 - 25 a p-type GaP transparent substrate formed on the ohmic contact electrode;
 - a first p⁺-type contact layer of p⁺-type GaAs formed on the p-type GaP transparent substrate;
 - an indium tin oxide amorphous interface layer formed on the first p⁺-type contact layer;
 - 30 a second p⁺-type contact layer of p⁺-type GaAs formed on the indium tin oxide amorphous interface layer;
 - a p-type cladding layer of a p-type AlGaInP formed on the second p⁺-type

- contact layer;
a multiple quantum well light-emitting layer of AlGaInP formed on the p-type cladding layer;
an n-type cladding layer of n-type AlGaInP formed on the light-emitting layer;
5 a stop layer of n-type AlGaAs formed on the n-type cladding layer;
an ITO transparent conductive layer formed on the stop layer;
a first electrode formed on the ITO transparent conductive layer.
11. (original): A light emitting diode having a transparent substrate, the light
10 emitting diode comprising:
a first electrode;
an n-type transparent substrate formed on the first electrode;
an amorphous interface layer formed on the n-type transparent substrate;
an n-type contact layer formed on the amorphous interface layer;
15 an n-type cladding layer formed on the n-type contact layer;
a light-emitting layer formed on the n-type cladding layer;
a p-type cladding layer formed on the light-emitting layer;
a p-type buffer layer formed on the p-type cladding layer;
a p⁺-type contact layer formed on the p-type buffer layer;
20 a transparent conductive layer formed on the p⁺-type contact layer; and
a second electrode formed on the transparent conductive layer.
12. (original): A light emitting diode having a transparent substrate, the light
emitting diode comprising:
25 a first electrode;
a transparent substrate of n-type GaP formed on the first electrode;
an indium tin oxide (ITO) amorphous interface layer formed on the transparent substrate of n-type GaP;
a contact layer of n-type GaP formed on the ITO amorphous interface layer;
30 a cladding layer of n-type AlGaInP formed on the contact layer of n-type GaP;
a multiple quantum well (MQW) light-emitting layer of AlGaInP formed on the cladding layer of n-type AlGaInP;

- a cladding layer of p-type AlGaInP formed on the MQW light-emitting layer of AlGaInP;
a buffer layer of p-type AlGaAs formed on the cladding layer of p-type AlGaInP;
a contact layer of p⁺-type GaAs formed on the buffer layer of p-type AlGaAs;
5 an ITO transparent conductive layer formed on the contact layer of p⁺-type GaAs;
and
a second electrode formed on the ITO transparent conductive layer.
13. (original): A light emitting diode having a transparent substrate, the light
10 emitting diode comprising:
a transparent substrate;
an amorphous interface layer formed on the transparent substrate, a top surface
of the amorphous interface layer comprising a first surface region and a
second surface region;
15 an n⁺-type reverse-tunneling contact layer formed on the first surface region;
a p-type cladding layer of formed on the n⁺-type reverse-tunneling contact layer;
a light-emitting layer formed on the p-type cladding layer;
an n-type cladding layer formed on the light-emitting layer;
a first contact electrode formed on the n-type cladding layer; and
20 a second electrode formed on the second surface region.
14. (original): A light emitting diode having a transparent substrate, the light
emitting diode comprising:
a transparent substrate comprising glass;
25 an indium tin oxide (ITO) amorphous interface layer formed on the transparent
substrate, a top surface of the ITO amorphous interface layer comprising a
first surface region and a second surface region;
a reverse-tunneling contact layer of n⁺-type InGaN formed on the first surface
region;
30 a cladding layer of a p-type GaN formed on the reverse-tunneling contact layer
of n⁺-type InGaN;
a multiple quantum well (MQW) light-emitting layer of InGaN formed on the

- cladding layer of a p-type GaN;
- a cladding layer of n-type GaN formed on the MQW light-emitting layer of InGaN;
- a first contact electrode formed on the cladding layer of n-type GaN;
- 5 a second electrode formed on the second surface region.